Using Family Radio Service (FRS and General Mobile Radio Service (GMRS) Radios for Disaster Communications

I. Radio Models: FRS, GMRS, and Dual Service Radios (GMRS/FRS): An Overview

II. Operating your radio:

III. Message Protocols, Procedures, and Intra-Area CERT FRS/GMRS Net Operation

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V. Mapping your maximum distance of radio operations within a block, block to block, and block to Area ICP

I. Overview of choosing the best FRS/GMRS Radio

First, all buyers need to be aware of the effects regarding the new FCC rule changes that went into effect in November 2017; as it will affect the future of FRS radio usage and the new wave of FCC certified radios. Currently on the market we have FRS only radios (the least expensive), FRS/GMRS dual service radios, and GMRS only radios. All that will change soon, and dual service radios will no longer be FCC type certified. Rather FRS only and GMRS only certified radios will be type accepted. Since the power output for FRS radios on FRS channels have been raised to 2 watts (from .5 watts) and higher power GMRS radios are now allowed on what was FRS only channels, the preexisting FRS only radios will most likely be over-powered and at a disadvantage.

The new rules, channel designators, and power limitations, followed by the old and out of date designations follows:

FRS and GMRS Frequencies

Channel	Type	Frequency	FRS Power/Bandwidth	GMRS Power/Bandwidth
1	FRS/GMRS	462.5625	2W / 12.5kHz	5W / 25kHz*
2	FRS/GMRS	462.5875	2W / 12.5kHz	5W / 25kHz*
3	FRS/GMRS	462.6125	2W / 12.5kHz	5W / 25kHz*
4	FRS/GMRS	462.6375	2W / 12.5kHz	5W / 25kHz*
5	FRS/GMRS	462.6625	2W / 12.5kHz	5W / 25kHz*
6	FRS/GMRS	462.6875	2W / 12.5kHz	5W / 25kHz*
7	FRS/GMRS	462.7125	2W / 12.5kHz	5W / 25kHz*
8	FRS/GMRS	467.5625	0.5W / 12.5kHz	0.5W / 12.5kHz
9	FRS/GMRS	467.5875	0.5W / 12.5kHz	0.5W / 12.5kHz
10	FRS/GMRS	467.6125	0.5W / 12.5kHz	0.5W / 12.5kHz

11	FRS/GMRS	467.6375	0.5W / 12.5kHz	0.5W / 12.5kHz
12	FRS/GMRS	467.6625	0.5W / 12.5kHz	0.5W / 12.5kHz
13	FRS/GMRS	467.6875	0.5W / 12.5kHz	0.5W / 12.5kHz
14	FRS/GMRS	467.7125	0.5W / 12.5kHz	0.5W / 12.5kHz
15	FRS/GMRS	462.5500	2W / 12.5kHz	50W / 25kHz*
16	FRS/GMRS	462.5750	2W / 12.5kHz	50W / 25kHz*
17	FRS/GMRS	462.6000	2W / 12.5kHz	50W / 25kHz*
18	FRS/GMRS	462.6250	2W / 12.5kHz	50W / 25kHz*
19	FRS/GMRS	462.6500	2W / 12.5kHz	50W / 25kHz*
20	FRS/GMRS	462.6750	2W / 12.5kHz	50W / 25kHz*
21	FRS/GMRS	462.7000	2W / 12.5kHz	50W / 25kHz*
22	FRS/GMRS	462.7250	2W / 12.5kHz	50W / 25kHz*
RPT15	GMRS	467.5500	-	50W / 25kHz*
RPT16	GMRS	467.5750	-	50W / 25kHz*
RPT17	GMRS	467.6000	-	50W / 25kHz*
RPT18	GMRS	467.6250	-	50W / 25kHz*
RPT19	GMRS	467.6500	-	50W / 25kHz*
RPT20	GMRS	467.6750	-	50W / 25kHz*
PRT21	GMRS	467.7000	-	50W / 25kHz*
RPT22	GMRS	467.7250	-	50W / 25kHz*

FRS and GMRS Frequencies prior to 2017 Part 95 Reform (Old Rules)

Channel	Type	Frequency
1	FRS / GMRS	462.5625
2	FRS / GMRS	462.5875
3	FRS / GMRS	462.6125
4	FRS / GMRS	462.6375
5	FRS / GMRS	462.6625
6	FRS / GMRS	462.6875
7	FRS / GMRS	462.7125
8	FRS	467.5625
9	FRS	467.5875
10	FRS	467.6125
11	FRS	467.6375
12	FRS	467.6625
13	FRS	467.6875
14	FRS	467.7125
15	GMRS	462.5500
16	GMRS	462.5750
17	GMRS	462.6000
18	GMRS	462.6250
19	GMRS	462.6500

20	GMRS	462.6750
21	GMRS	462.7000
22	GMRS	462.7250

Note that FRS has been given additional channels (15-22) and also higher power privileges (2 watt maximum), while both are restricted to only 1/2 watt on channels 8-14.

One will notice that the new 2017 channel designators (ch 1-22) are now different and uniform to both FRS and GMRS. FRS has increased power permissions up to 2 watts on channels 1-7 and 15-22, which is a large step up from only a 1/2 watt. This will increase one's range considerably, but also will create marginalization for older FRS-only radios, which run lower power (1/2 watt).

The only benefit of a GMRS license is the ability to use a repeater and communicate longer distances by using higher power and better antennas. The FCC allows GMRS to use removable antennas allowing the use of externally mounted higher gain and elevated antennas, thus considerably extending both their receive and transmitting range. Notice the use of GMRS requires an FCC license, whose application is a one time cost of $65 currently. FRS is free and unlicensed.

When shopping for a new FRS or GMRS radio there will be many considerations. One is cost, the old style FRS radios being the least expensive. Mid-range in cost are the dual service FRS/GMRS radios, which are being phased out but still available. Radios will vary in power and features. Strive to obtain at the very least the 22 channel radios with the alkaline battery pack accessory. Radios will vary in power output capability, so the buyer will have to read the specifications to help their decision. Kensington CERT has decided on the Motorola MS350R. Note that the MS355R is similar. Also the Midland radios such as the GXT1000VP4 (takes alkaline batteries and rechargeable batteries both kinds) are alos recommended for reasons of uniformity and familiarity. Also a new contender is the BTECH GMRS V1 which is the most powerful of the trio and comes with a detachable antenna. The BTECH GMRS V1 is FCC approved. They are approximately $50 each at Amazon from BTECH. Note that a GMRS license is required to operate the BTECH GMRS V1.

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II. **Operating Your Radio** (Note each radio manufacturer and model will operate differently.

In General:

If present turn **OFF and disable** private codes and special/private channels
Turn off squelch codes
Turn off VOX

Turn off emergency call functions (alerts/sirens)
Turn off roger beeps
Turn off all scramble features
Turn off scanning
Stay on your designated channel adjusting the volume control and squelch appropriately

Know how to:

Turn on and off the radio
Set the volume level
Set the squelch level
Change channels
Transmit (**push and hold the PTT** (**Push to talk)** button and then **release** the button in order to receive
Set high and low power (if available). Use lowest power possible for good communications, while using high power only when necessary.
Change batteries and obtain spare battery packs and especially a backup alkaline battery holder
Keep rechargeable **batteries charged** (Schedule a recharge at least every two months when not in use).
Have spare alkaline batteries (AA or AAA) available.
Have a standard CERT Go-Kit with check list handy and include your radio equipment as part of the kit.
Plug in and use **headsets,** speaker microphone, or earphones in high noise environments, for privacy, and in order not to disturb others.
Hold radio so that the **antenna is vertical** to the earth and as high as practical.
Talk directly and clearly into the microphone; but do not yell or whisper.
Be succinct and brief. When in doubt let go of the PTT button and pause to keep the channel clear.
Locate the designated primary channel; and also the alternative/secondary channel should the primary channel become unusable. Example use channel 7 as primary and channel 6 as secondary.

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Protocols, Procedures, and Operations

Avoid jargon, but do use standard abbreviations.

Use the word, “OVER” at the end of a transmission when waiting for a response.
Use the word, “CLEAR” or “OUT” when indicating that you have no further business. .

Use assigned tactical callsign designators such as:

Block 1 IC (Incident Commander for block 1)
KEN 6 IC (Incident Commander for Kensington Area 6)
Block 2 Triage
Block 1 Search and Rescue
KEN 6 Cache Manager
EC9 block 7 Captain,
Fire Station 72
Etc.

Example: Block 1 IC says: “KEN 6 IC this is Block 1 IC”
KEN 6 IC answers: “Block 1 IC go ahead” or “Block 1 IC go”
Block one IC: “I have written traffic. Are you ready to copy?”
Ken 6: “Ready” or “Standby” (as the case may be)
When traffic has been passed. Both stations will say: “Clear”

Example: Block one captain voices: “Block one search and rescue, this is block one captain”
Block one search and rescue replies: “Block one search and rescue, go ahead”

When communicating with another FRS station it is standardized procedure to voice the station’s tactical callsign that you are calling first; followed with your own tactical callsign.
Example: “Block Captain 6, this is KEN 6 IC” or better “Block Captain 6, Ken IC”
However when operating in a network of multiple stations, just drop your own callsign first in order to get net control’s attention.
Example: “Block Captain 7”. “Less efficient (more wordy) would be, “Net Control this is Block Captain 7, over”.
The Net Control Station however rarely needs to identify itself. NCS calls and acknowledges stations by simply dropping their tactical callsign.
Example: “Block Captain 8”. Less efficient as, “Block Captain 8, this is net control, over”
If block captain 2 wants to communicate with net control, Block Captain 2 simply voices, “Block Captain 2”. Net Control will acknowledge them saying, “Block Captain 2, go”.

III. Net Procedures and Protocols in a Directed Net.

At the Onset of a Disaster

Given the signs of an earthquake or other disaster, the area coordinator and or designated assistant, block captains, and CERT operators will check in on their designated channels.

Blocks and local neighborhoods report to their block captain on their designated block FRS channel. Preliminary damage assessment begins.

Block captains check-in on the designated AREA FRS/GMRS channel to contact the CERT Area Coordinator or leader at the CERT Area ICP.

At the discretion of the Area Coordinator, the net manager, or designated assistant an informal net can begin on the designated CERT area channel. If there are reports of destruction, impending safety hazards, and/or injuries, a directed net should be initiated within the AREA linking the AREA ICP with all the blocks through designated block captains.

Example: A Net control voices: This is Kensington Area K3 FRS/GMRS Net. Are there any block captains to check-in? Is there any emergency traffic? Is there any priority traffic?

Block Captains will check-in. If there are many talking over each other then the net control station (NCS) will call out specifically for block captains. Example: K3 Block Captains 1 through 3 please call-in now. 1-3 only. Block Captains 4-6 only", etc.

The designated net control or AC will have to innovate depending upon how heavy the traffic. (If only a few captains are reporting in, then the NCS can call for blocks 1-10, blocks 11-22 etc. More than 25 blocks on one channel would be a sign to open a secondary net.

Comment: Limit blocks to less than 25 per area on any one channel.

The block captains should be familiar the Modified Mercalli scale (see: https://earthquake.usgs.gov/learn/topics/mercalli.php)

Example: "This is block captain 3. MM 9 Over"
NCS: "Block 3 Copy"

NCS: "Block 4"
Block 4 captain: "Block 4, MM 7, Over"
NCS: "Block 4, copy"
Etc.

Reporting using the MM system throughout the area will give the Area IC, the NCS, and the AC a decent picture of possible damage and what to do next.

Ongoing Net Operations

If the block captains are well trained they will also begin a windshield damage assessment survey and triage using their discretion.

It is very possible at this early stage that the EOC will not yet be fully activated and staffed via ham radio and operational. At this stage ACs, are more informed of the situation and should not wait for any official word from the EOC to activate damage assessment and life saving operations.

NCS should frequently ask "Are there any relays", ask some distant FRS operator to also make a call for those who can't hear NCS. This is where a GMRS radio (higher power and an outside gain antenna) will help tremendously increasing coverage. Thus it would be preferable for a GMRS station to act as NCS, while using the minimum power necessary to maintain communications.

Next Steps

NCS: "All block captains begin windshield damage assessment and if manpower permits possible local triage and search and rescue operations"

NCS will need to make periodic statements of "This is a simulated emergency test of Kensington CERT", or if the real thing. "This is an Emergency Net for Kensington CERT Area 6, emergency operations. Please keep this channel free for emergency or priority traffic."

Some may be windshield damage assessments (sizeups) in EC-1 format. Most likely no forms 213 will be generated on the block level. Form 213s will be used by the hams to and from the EOC when written traffic is warranted; however a log of all traffic on the net should be written without delaying traffic.

Messages will be composed for common needs such as reports of fires, requests for diabetic medication, blankets, dry clothing, potable water, tools, flashlights, batteries, medical supplies, skilled personnel, and related logistic concerns. These latter logistic requests do not need to be on form IC-213; however they should be logged by NCS or a logger/scribe.

Example:

"This is block captain 3"
NCS: Captain 3 go
Block Captain 3: "Need two heavy duty long crowbars"
NCS: Copy 3, stand by.
NCS: "Block Captain 4"
Block Captain 4: "Block 4, go"
NCS: "Do you have extra heavy duty long crowbars to lend to Block 3?"
Block 3: "negative"
NCS: "Does any block have any extra heavy duty long crowbars to lend to Block 3?"
Etc until is located.

The above are examples of direct operations without a net control. If the involved blocks are neither numerous or very busy **direct** communication is most efficient. However, during larger operations it is most efficient to have a net control station (NCS) to facilitate the net traffic. In such cases a directed net is most effective, wherein all stations notify the NCS of their radio traffic and the NCS then directs them on what to do.

Choosing the NCS shall be determined by the Area Coordinator's Communications' specialist. One qualification is that the NCS should be located in an area where there is best radio coverage, so that the NCS can ideally talk to all blocks directly as well as the Area IC. This is best accomplished by a GMRS operator with an external gain antenna running high power. Consideration must also be given to the NCS's skill and experience.

Please refer to the Section on Mapping of the Area and block

Examples of Procedures, Protocols, and Operations in an Earthquake Scenario

An example assuming the involvement of 20 blocks in KEN 6 during the aftermath of a nearby 6.6 earthquake.

All CERT personnel with radios turn on and tune into their Area designated channel (Channel 7). **The first station on the channel will activate the net** by voicing. This is Cert Block X member in KENSINGTON AREA 6, is there any emergency or priority traffic? This station will act as Net Control Station (NCS) until reassigned by the KEN 6 Area Coordinator or IC given the above qualifications.

PAUSE FREQUENTLY BY RELEASING the PTT BUTTON

Anybody out there? Please check-in. Pause. Are there any injuries? Pause. Is there any severe damage to report? Assuming that the disaster is severe eventually a skilled block captain, a trained IC, or the Area Coordinator will come on the channel and designate a skilled NCS station. Before that happens, YOU are it.

The NCS Operation in a Directed Net

The NCS will first ascertain who is on the channel. Were they are located. What is their status/situation. This information should be logged and passed on to one's relief after one's shift. (See appendix for the form)

If immediate personal safety needs are taken care of, then a damage assessment (windshield survey) should then proceed. (see appendix for the form CERT 1)

Examples: NCS reads the preamble to convene the net identifying the CERT Area involved, that this is an emergency net, that a clear frequency is appreciated, and that no stations should transmit without permission from net control.

Is there any emergency traffic, come now
Is there priority traffic, come now?

Stations checking in by block. Block 1, block 2, etc.

Stations with traffic should call net control at any time by stating their tactical designators.
Example: "This is block two IC"
NCS: "Block two IC, go"
Block 2 IC. "I have emergency traffic for KEN 6 IC"
NCS: "Block two, call KEN 6 IC here and pass your traffic."
Block two IC: "KEN 6 IC are you ready to copy written traffic?"
KEN 6 IC: "KEN 6 IC, ready."
After the after the traffic is completed, KEN 6 IC voices, "Message received" or "Roger"
Block two IC voices: "Block two IC clear"

Changing Channels

If Channel 7 is very busy with other emergency traffic, the NCS may decide to move the block two IC and KEN 6 IC to channel 6 to pass their traffic.
NCS: "Block two IC call KEN 6 IC and if solid copy, move to channel 6 to pass your emergency traffic.
Block Two: "Ken 6 IC, please move to channel 6 if you copy"
Ken 6 IC: "Copy, and going now" or just "roger, going"

Needing a Relay

If Ken 6 IC and Block two IC cannot copy each other, they will need a station who can copy both to relay.
Example: KEN 6 IC: Negative copy on block two IC"
NCS: Can anyone copy both KEN 6 IC and Block two UC".
Block captain four: "Block captain four, copy both solid"
NCS: Block Captain four, please establish contact with both KEN 6 IC and Block two IC here. If solid move them off the channel 6 to realy.
Block Captain Four: "Roger, Block two IC how do you copy?
Block two IC: "Loud and clear"
Block Captain Four: "KEN 6 IC how do you copy"?
Ken 6 IC: "Loud and clear".
Block captain 4: "Both KEN 6 IC and block two IC, please meet me on channel 6"
KEN 6 IC: "Ken 6 IC going"

Block two IC: “Block II IC going”

Block captain four then established contact with both stations on channel 6. Receiving the message from block two IC and relaying it to KEN 6 IC. All three stations then check back in to the NCS on channel 7 when the frequency is paused.

Example: “Block two IC clear”
NCS: “Roger block two IC”
KEN 6: “KEN 6 IC back and clear”
NCS: “Roger KEN 6 IC”
Block Captain 4: “Block captain four, back, traffic passed”.
NCS: “Roger Block captain four, thank you”

NCS should leave numerous pauses – say “break” and then release the PTT button
All operators but especially the NCS should have spare batteries or another source of emergency power capable for operation of 8 hours or more. The NCS should keep a log, have spare ICS forms 213 and CERT form 1 (size-up sheets).

Message Precedences: Emergency (E), Priority (P), Disaster Welfare Traffic (W) and Routine (R) Traffic

Assigning the correct precedence to each message is important Emergency traffic is always handled first, then Priority Traffic. If time permits outgoing Health and Welfare Traffic is next in importance.

Message handling protocols and procedures extend beyond the scope of a short handbook such as this. Please consult the addendum for more. In short, the standard abbreviations and usage should be learned.
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Glossary and Abbreviations:

Affirm: Affirmative, Yes, Will comply. Also use “Will Co”

Back: I am back on frequency and in operation, standing by.

CERT: Community Emergency Response Team. There are 11 designated areas in El Cerrito and 6 in Kensington, for a total of 17 CERT Areas.
See EC CERT map: HYPERLINK "http://el-cerrito.org/DocumentCenter/View/3358" http://el-cerrito.org/DocumentCenter/View/3358

Clear: Finished, Also voice “OUT”. Clear and out signify no further traffic.

Confirmed: Signifies: “That is correct”.

Directed Net: The Net Control Station (NCS) is in charge of the operation. For routine or priority traffic say break. For emergency traffic say: “break break”. The NCS will say: “station go ahead”. Then identify yourself and list your traffic. The NCS will then give further procedural instructions. For emergency traffic it is best to say, “EMERGENCY” and then the NCS will recognize you. Use “break” for routine traffic and say, “PRIORITY{, for priority traffic.

Duplex: Operation where the transmit frequency differs from the receive frequency. Duplex operation is commonly used in repeater operation as well as in cross band operation.

Simplex: Direct communications where the transmit and receive frequencies are the same.

EOC: Abbreviation Emergency Operations Center located across from main El Cerrito FD in the Public Safety Building. Each city and county have their own EOCs.

ERP: Effective Radiated Power. Usually calculated by RF output in watts times the gain of the antenna over a theoretical dipole (dBd). EIRP is the effective radiated power using a theoretical isopole (dBi), which is theoretically 2.5 db less efficient than dBd.
Examples: 5 watts RF output using a dipole antenna would equal 5 Watts ERP.
Using 5 watts RF output a 3 dBd gain antenna, the ERP would be 10 watts.

FRS: Family Radio Service limited to .5 watts on channels 8-15, and 2 watts on ch.1 – 7 and 2 watts on Ch. 16-22. External antennas are not allowed. FRS works well for short distance radio communications within buildings and blocks (line of sight) depending upon terrain.
HYPERLINK "https://www.fcc.gov/general/family-radio-service-frs" https://www.fcc.gov/general/family-radio-service-frs

GMRS: General Mobile Radio Service uses channels from around 462 MHz to 467 MHz. The most common use of GMRS channels are for short to medium distance two-way communications using hand-held radios similar to walkie-talkies, base stations, and repeaters. A small base station is one that has an option of an outside antenna and can transmits with no more than 5 watts on channels 1-7, .5 Watts on channels 8-15, and 50 watts on the rest of the GMRS frequencies (Ch. 16-22)
HYPERLINK "https://www.fcc.gov/general/general-mobile-radio-service-gmrs" https://www.fcc.gov/general/general-mobile-radio-service-gmrs

OES: Office of Emergency Services

OLD FRS/GMRS Channel nomenclature: Please note that the channel designators for GMRS and FRS changed as of September 1, 2017
For example: channel 7 FRS is the old GMRS channel15 but the frequency is the same 462.7125 MHz. This information may be useful to avoid confusion for those who have older equipment. In the new radios Channels will be designated 1-22.

GMRS and FRS Dual Service Radios

Many manufacturers have in the past received approval to market radios that are certified for use in both GMRS and FRS. Other manufacturers have received approval of their radios under the GMRS rules, but market them as FRS/GMRS radios on the basis that some channels are authorized for both services, or a user of the device may communicate with stations in the other service.

Radios marketed as "FRS/GMRS" or "dual-service radios" are available from many manufacturers and many retail or discount stores. The manual that comes with the radio, or the label placed on it by the manufacturer, should indicate the service the radio is certified for. If you cannot determine what service the radio may be used in, contact the manufacturer. If you operate a radio under the GMRS rules, you must have a GMRS license. GMRS radios generally transmit at higher power levels. In GMRS 5 watts is typical on channels 1-7, 1/2 watt on ch. 8-15, and 5-50 watts on the other GMRS channels). GMRS only radios may have detachable antennas as compared to FRS radios with non-detachable antennas. Hence, GMRS will increase the range of your communications considerably.

For FRS, you are not required to have a license, if you operate a radio that has been approved for FRS and restrict operations exclusively to the FRS channels with a maximum power of 2 watts of effective radiated power and with an integral antenna Exception: Channels 8-15 are restricted to .5 watts)

Ham: A FCC licensed amateur radio operator capable of high power, multiple channel, and long distance communications.

IC: Incident Commander: One who is in command of the Operation. It wise to use the identifying preface for Area Incident Commander, and Block Incident Commander. Example: EC2 IC or EC2 block 14 IC (or EC2 block 14 captain).

ICP: Incident Command Post

ICS: Incident Command System. Used for interoperability to integrate diverse disaster services agencies under a single command (Incident Commander – IC).

KHz: Kilohertz. A frequency abbreviation for one thousand Hertz (cycles per second)

Logistics Net: A net dealing with the procurement, maintenance, and transportation of material, facilities, staffing, and scheduling personnel during a disaster.

MHz: Abbreviation for Megahertz a frequency measurement equal to one million Hertz (cycles per second).

NCS: Net Control Station

OES: Office of Emergency Services often located at the State and county EOCs

OVER: Go ahead or simply voice, "go"

Precedences:
EMERGENCY—Any message having life and death urgency to any person or group of persons, that is transmitted by Amateur Radio in the absence of regular commercial facilities. This includes official messages of welfare agencies during emergencies requesting supplies, materials or instructions vital to relief efforts for the stricken populace in emergency areas. On CW and digital modes, this designation will always be spelled out. When in doubt, do not use this designation.
PRIORITY—Abbreviated as P on CW and digital modes. This classification is for important messages having a specific time limit, official messages not covered in the emergency category, press dispatches and emergency-related traffic not of the utmost urgency.
WELFARE—Abbreviated as W on CW and digital modes. This classification refers to an inquiry about the health and welfare of an individual in the disaster area, or to an advisory from the disaster area that indicates all is well. Welfare traffic is handled only after all Emergency and Priority traffic is cleared. The American Red Cross equivalent to an incoming Welfare message is DWI (Disaster Welfare Inquiry).
ROUTINE— Abbreviated as R on CW and digital modes. Most traffic in normal times will bear this designation. In disaster situations, traffic labeled Routine should be handled last, or not at all when circuits are busy with higher-precedence traffic.

Resource Net: For larger-scale incidents, a Resource Net is used to recruit operators and equipment in support of operations on the Tactical Nets. As an incident requires more operators or equipment, the Resource Net evolves as a check-in place for volunteers to register and receive assignments. Also used to track personnel back and forth safely to and from assignments.
Resource Nets may be combined within and under **Logistics** (a **Logistic Net**) unless traffic becomes too heavy. In case of heavy traffic, a new frequency and net control station should be established for an independent **Resource Net** apart from the **Logistics Net**.

Roger: Message received. Or voice "check"

Tactical Callsign: Use whatever designators that are unambiguous and uniquely identifies the function and location of the radio operator. Example: EOC, Fire Station 65, EC8 ICP, KEN6 block2 captain, etc.

Tactical Net: The Tactical Net is the front line net employed during an incident, usually used by a single government agency to coordinate with Amateur Radio operations within their jurisdiction. There may be several tactical nets in operation for a single incident depending on the volume of traffic and number of agencies involved. Communications include traffic handling and resource recruiting.

Triage areas: Locations used to evaluate medial casualties and/or to perform temporary emergency medical treatment if required.

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IV: A Simulated Emergency Test (SET) Utilizing FRS/GMRS

Net Operations in a SET:

Follows are items and scenarios that will test our disaster communications' readiness.

Block Captains will check-in. If there are many talking over each other then call specifically for block captains 1-3 only. Block Captains 4-6 only etc. The designated net control or AC will have to wing it depending on how heavy the traffic. (If only a few captains are reporting in, then the NCS can call for blocks 1-10 -- blocks 11-22 etc. Any more than 25 blocks on one channel would be too much.

The block captains should be familiar the Modified Mercalli scale (MM). Please see https://earthquake.usgs.gov/learn/topics/mercalli.php

Example: "This is block captain 3. MM 9 Over"
NCS: "Block 3. Copy"

NCS: "Block 4"
Block 4 captain: "Block captain 4 MM 7, Over."
NCS: "Block 4, copy"

The MMs throughout the area will give the Area IC, the NCS, the AC and maybe the EOC a decent picture of possible damage and what step to take next.

If the block captains are well trained they will also begin a windshield damage assessment, search and rescue, and triage activities using their discretion. It is very possible at this stage that the EOC will not yet be staffed via ham radio and operational, so you, as AC, are simply ahead of the game and should not wait for any official word to activate given the above.

Always ask "Are there any relays" and or ask some distant FRS operator to also make a call for those who can't hear NCS. This is where a GMRS radio (higher power and an outside gain antenna) will help tremendously increasing coverage.

Using discretion as NCS or IC one realizes that no two disasters are alike and none go exactly to plan.

Example:

NCS: "All block captains begin windshield damage assessment and if manpower permits possible local triage and search and rescue operations"

NCS will need to make periodic statements such as "This is a simulated emergency test of Kensington CERT 6."

All messages should begin with: “This is a test message”

During a real disaster, periodic transmissions should be made from NCS to request "a clear frequency to permit emergency communications".

During the SET at specified times various previously test written messages will be sent from and to block captains.

Some may be windshield damage assessments either in form 213 format or which might be composed by the AREA Coordinator beforehand; or else have the Block Captains compose their own test messages. Do they know how to transpose Size-up form into a Form IC-213?

Query do we know how to transpose an EC 1 windshield size-up to a form 213 or does this need to be worked out before the drill?

Other messages will be composed for common needs such as reports of fires, requests for diabetic medication, blankets, dry clothing, potable water, tools, flashlights, crow bars, batteries, medical supplies, skilled personnel, etc. These latter logistic requests do not need to be on form 213; however they should be logged by NCS or a logger/scribe.

After the SET is called to a close a Critique should be held and all messages and logs collected for evaluation.

A group lunch, picnic, coffee clutch, or similar can then follow.

V: Mapping Interblock, Intra-block, and ICP to all blocks.

Mapping is utilized to identify good communication locations and black radio holes. The general idea is that FRS radios work well for line of sight communication, but not so well through buildings, hills, or similar solid obstructions. One may talk from the Kensington Hills direct to Mt. the Albany flat lands, but not even within one's own area if there are hills or valleys between the communication points. Even within a steel or concrete building FRS communications may be impossible. The only way to identify in advance trouble spots is to map the area before hand.

Mapping the Area ICP location, Gathering point, and Staging Point, Triage, Area wide Cache Site with each block is and Staging inside a block, inter-block, and ICP to all blocks

1) Intra-block -- Within a block, test communication between all resident locations and the block ICP
2) Block to Area ICP -- Test also to and from the Block ICP to and from the Area ICP.

These are two primary mapping tasks.

Additionally test direct comms from block to block directly. This will not be complete without a relay. At least one GMRS station with an external antenna will be of great assistance in order to hear all blocks.
Additionally one may test comms to staging areas, cache locations, and other locations as decided by the KEN 6 CERT Area Coordinator.

There will be assigned a ham radio operator to each CERT Area ICP who will then relay EOC destined traffic.

If a relay is needed from/to a known dead spot or grey area, ask for a relay.
Example: "This is Block 7 Captain. Can anyone copy and relay to KEN 6 ICP?"
Block 6 IC: "Block 7 Captain this is Block 6 IC, can do. Standby and I will pass your traffic when ready"

At this point it is necessary to inform the Net Control Station that Block 7 Captain has traffic

but needs a relay.
Example:
Block 6 IC: “Relay”
NCS: “Relay go”
Block 6 IC: This is Block 6 IC relaying for Block 7 Captain who has Emergency Traffic”
NCS: Block 6 IC go ahead and relay the traffic here. The entire net please standby while emergency traffic is being relayed.
Block 6 IC: “Block Captain 7 this is Block 6 IC. Ready to copy your traffic, go ahead”
The message is passed and receipt is acknowledged by “roger”
Block 6 IC then reports to the NCS: “This is Block 6 IC message passed. I have one emergency message for the EOC”.
NCS directs: “Block 6 IC send your traffic KEN 6 Ham now on frequency and so forth.

NCS could have directed Block6 IC and Bloc7 Captain to pass their traffic on channel 6 and come back, if the traffic on the primary channel (in this case, channel 7) was heavy. Similarly, the NCS could have also sent KEN6 Ham to channel 6 to pass the traffic and then return.

Proactive mapping becomes a valuable adjunctive source of information in order to identify potential dead spots within the area.

Page Break

References:

FRS/GMRS Frequency/Power Charts and Rules

HYPERLINK "https://wiki.radioreference.com/index.php/FRS/GMRS_combined_channel_chart" https://wiki.radioreference.com/index.php/FRS/GMRS_combined_channel_chart

HYPERLINK "https://www.buytwowayradios.com/blog/2006/07/frs_and_gmrs_frequencies.aspx" https://www.buytwowayradios.com/blog/2006/07/frs_and_gmrs_frequencies.aspx

See also HYPERLINK "https://www.fcc.gov/wireless/bureau-divisions/mobility-division/family-radio-service-frs" https://www.fcc.gov/wireless/bureau-divisions/mobility-division/family-radio-service-frs

Addendum:

Message handling procedures and protocols, radio go-kits, net operations, and advanced training see the KaroEcho Field Resources and Operations Handbook at www.karoecho.net